CLAIMS

1. Multistable actuator (10), characterised in that it comprises:

- a mobile part (12) intended to be moved between at least two stable positions,

- opposing movement means (14, 16) for moving said mobile part (12),

- guide means (122, 186, 24, 246, 247, 248, 249) for guiding the movement of said mobile part (12), and

- support means (20, 22, 28, 30, 246, 247, 248, 249) for holding the mobile part (12) in each of the stable positions that it occupies,

in that said movement means (14, 16) are two opposing movement means, each made of a shape memory alloy,

and in that the mobile part (12), the movement means (14, 16) and the guide means (122, 186, 24, 246, 247, 248, 249) are produced in the form of a shape memory alloy-based one-piece structure, of which at least the movement means (14, 16) have been subjected to a treatment conferring shape memory properties thereon.

2. Actuator (10) according to claim 1, characterised in that the mobile part (12), the movement means (14, 16), the guide means (122, 186, 24, 246, 247, 248, 249), and the support means (20, 22, 28, 30, 30, 246, 247, 248, 249) are produced in the form of a shape memory alloy-based one-piece structure, of which

at least the movement means (14, 16) have been subjected to a treatment conferring shape memory properties thereon.

3. Actuator (10) according to claim 1 or 2, characterised in that said movement means (14, 16) are made of a shape memory alloy belonging to the group consisting of Ni-Ti, Ni-Ti-Cu, Cu-Al-Ni, Cu-Al-Be, Fe-Pt, Fe-Rd or Fe-Ni-Co-Ti.

4. Actuator (10) according to any one of claims 1 to 3, characterised in that the two opposing movement means (14, 16) are made of a single two-way shape memory alloy.

5. Actuator (10) according to any one of claims 1 to 4, characterised in that the guide means (122, 186, 24, 246, 247, 248, 249), and the support means (20, 22, 28, 30, 246, 247, 248, 249) constitute an integrated stepper mechanism.

6. Actuator (10) according to any one of claims 1 to 5, characterised in that it is an actuator with rotary movement.

7. Actuator (10) according to any one of claims 1 to 5, characterised in that it is an actuator with linear movement.

8. Actuator (10) according to any one of claims 1 to 7, characterised in that the guide means

comprise at least one sliding bearing (122, 186) and the support means comprise projecting portions (20) in one of the two parts among the mobile part (12) and a reference part (18), and recessed portions (22) in the other of these parts.

9. Actuator (10) according to any one of claims 1 to 7, characterised in that said guide means comprise a plurality of elastic beams (24, 246, 247, 248, 249) and the support means (20, 22, 28, 30, 246, 247, 248, 249) comprise recessed portions (28) in the mobile part (12) and projecting portions (30) in a reference part (18).

10. Actuator (10) according to any one of claims 1 to 9, characterised in that the projecting portions (30) are flexible blades.

11. Actuator (10) according to any one of claims 1 to 10, characterised in that the one-piece structure is made from a shape memory alloy-based planar part by means of a laser cutting method.

12. Actuator (10) according to any one of claims 1 to 10, characterised in that the one-piece structure is made from a shape memory alloy-based planar part by means of an electrical discharge machining method, electrolithography, cathode spray deposition or waterjet cutting.

13. Actuator (10) according to any one of claims 1 to 12, characterised in that it is a bistable actuator in which the mobile part (12) moves between two stable positions.

14. Actuator (10) according to any one of claims 1 to 13, characterised in that the guide means and the support means are merged and consist of pre-stressed embedded beams (246, 247, 248, 249) of which the buckling enables the mobile part (12) to move.

15. Tactile interface (100), characterised in that it implements at least one one-piece structure comprising a plurality of multistable actuators (10) according to any one of claims 1 to 14.

16. Interface (100) according to claim 15, characterised in that it also comprises heating means (200, 215, 217) for heating the shape memory alloy-based movement means (14, 16).

17. Interface (100) according to claim 16, characterised in that said heating means (200, 215, 217) comprise heating resistors (200).

18. Interface (100) according to claim 16, characterised in that said heating means (200, 215, 217) comprise electrically conductive rods (215, 217).